

Claims

1. A vacuum apparatus comprising a plurality of components that are operated in a vacuum, a plurality of inner chambers that respectively accommodate these individual components, bellows that connect these respective inner chambers, an outer chamber that accommodates the plurality of inner chambers as a whole, and exhaust means installed in the respective inner chambers and the outer chamber.
2. The vacuum apparatus according to Claim 1, wherein this apparatus has piping that runs to the outside of the apparatus from the inner chambers, and the portions of this piping that reach the outer chamber from the inner chambers consist of a thin, flexible piping material.
3. The vacuum apparatus according to Claim 1, wherein the exhaust means installed in the inner chambers has a vibration-free type vacuum pump and a vibrating type vacuum pump that are installed in parallel.
4. The vacuum apparatus according to Claim 1, wherein the exhaust means installed in the inner chambers has a low-vibration type vacuum pump that evacuates the gas inside the inner chambers into the outer chamber, and an opening-and-closing valve that connects the inner chambers and the outer chamber.

5. The vacuum apparatus according to Claim 3, wherein the respective components and the vibration-free type vacuum pump inside the inner chambers are in a positional relationship which is such that these parts do not face each other, a heat-blocking plate is disposed between these components and the vibration-free type vacuum pump inside the inner chambers, and the surface of this heat-blocking plate on the side of the components is a mirror-finish metal surface.

6. A method for operating the vacuum apparatus according to Claim 3, wherein only the vibration-free type vacuum pump is operated during the operation of the components.

7. The vacuum apparatus operating method according to Claim 4, wherein in the exhaust of the gas inside the inner chambers, the opening-and-closing valve is first placed in an open state, and the gas inside the inner chambers and the gas inside the outer chamber are simultaneously exhausted by the exhaust means disposed in the outer chamber, so that the degree of vacuum is heightened, after which the opening-and-closing valve is closed, the low-vibration type vacuum pump is operated, and the exhaust of the gas inside the outer chamber is continued by the exhaust means installed in the outer chamber.

8. An exposure apparatus comprising a lens barrel which accommodates a projection optical system that projects a pattern on an original plate onto a sensitive

substrate, an original plate stage which moves and positions this original plate, a sensitive substrate stage which moves and positions the sensitive substrate, a plurality of inner chambers which respectively accommodate the original plate stage and the sensitive substrate stage, bellows which connect these respective inner chambers and the lens barrel, an outer chamber which accommodates the plurality of inner chambers and the lens barrel, and exhaust means installed in the respective inner chambers and the outer chamber.

9. The exposure apparatus according to Claim 8, wherein the exhaust means installed in the inner chambers has a vibration-free type vacuum pump and a vibrating type vacuum pump that are installed in parallel.

10. The exposure apparatus according to Claim 8, wherein the exhaust means installed in the inner chambers has a low-vibration type vacuum pump that evacuates the gas inside the inner chambers into the outer chamber, and an opening and closing valve that connects the inner chambers and the outer chamber.

11. The exposure apparatus according to Claim 8, wherein contamination removal means are installed in the respective inner chambers.

12. The exposure apparatus according to Claim 8, wherein the apparatus further comprises a body that supports the lens barrel, original plate stage and sensitive

substrate stage on the building floor, and a stage measurement reference device attachment member that is supported on this body, and an anti-vibration stand is installed at least between the body and the building floor or between the body and the lens barrel.

13. A method for operating the exposure apparatus according to Claim 9, wherein only the vibration-free type vacuum pump is operated during the exposure operation and alignment of the exposure apparatus.

14. A method for operating the exposure apparatus according to Claim 10, wherein in the exhaust of the gas inside the inner chambers, the opening-and-closing valve is first placed in an open state, and the gas inside the inner chambers and the gas inside the outer chamber are simultaneously exhausted by the exhaust means disposed in the outer chamber, so that the degree of vacuum is heightened, after which the opening-and-closing valve is closed, the low-vibration type vacuum pump is operated, and the exhaust of the gas inside the outer chamber is continued by the exhaust means installed in the outer chamber.